COVER SHEET

Rate and extent of compensatory changes in energy intake and expenditure in response to altered exercise and diet composition in humans

APPETITE, OBESITY AND METABOLISM:

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Rate and extent of compensatory changes in energy intake and expenditure in response to altered exercise and diet composition in humans

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We assessed the effect of no exercise (Nex; control) and high exercise level (Hex; ~4 MJ/day) and two dietary manipulations [a high-fat diet (HF; 50% of energy, 700 kJ/100 g) and low-fat diet (LF; 20% of energy, 300 kJ/100 g)] on compensatory changes in energy intake (EI) and energy expenditure (EE) over 7-day periods. Eight lean men were each studied four times in a 2 x 2 randomized design. EI was directly quantified by weight of food consumed. EE was assessed by heart rate (HR) monitoring. Body weight was measured daily. Mean daily EE was 17.6 and 11.5 MJ/day ($P < 0.001$) on the pooled Hex and Nex treatments, respectively. EI was higher on HF diets (13.4 MJ/day pooled) compared with the LF diets (9.0 MJ/day). Regression analysis showed that these energy imbalances induced significant compensatory changes in EB over time of ~0.3-0.4 MJ/day ($P < 0.05$). These were due to changes in both EI and EE in the opposite direction to the perturbation in energy balance. These changes were significant, small but persistent, amounting to ~0.2 and ~ 0.35 MJ/day for EI and EE, respectively.

appetite; energy balance; high-fat diet; low-fat diet; feeding behavior

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